Alcohol Control Policy
and the Blackfeet Reservation:
A Study of Attitudes Toward Alcohol

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Table of Contents

Table of Tables

Table of Figures

Alcohol Control Policy

Excessive consumption of alcohol is a worldwide health and social problem; "alcohol is a significant contributor to morbidity and mortality in the United States and worldwide" (Nelson et al. 2005, p. 441). Internationally, "alcohol consumption contributes to more than 60 health problems that cause an estimated 4% of the global disease burden" (Brand et al., 2007, p. 752). Many countries have implemented various alcohol control policies in order to address problems caused by alcohol abuse or from drinking beyond moderation. These countries include Latvia which has the highest per capita alcohol consumption rate in the world as a result of the greater availability of alcohol that resulted from the policies that liberalized the alcohol market following its independence in 1989 (Strazdins, 1995). The Netherlands implemented a comprehensive alcohol control policy of increased education, efficient treatment, and new legislation in 1986 after its alcohol consumption rate tripled between 1960 and 1980 (Ginneken & Iwaarden, 1989, p. 109). While the five Nordic Countries of Denmark, Finland, Iceland, Norway, and Sweden have a long history of alcohol control policies (Room, 2002), other like India (The Hindu, October 12, 2008) have recently began to discuss a policy. In the United States, the primary alcohol control policy since 1984 has been to have a national minimum legal drinking age of 21 years (Wechsler & Nelson, 2010). Nevertheless, alcohol abuse is a significant concern on US college campuses because excessive alcohol consumption has been associated with a wide variety of health, safety, and academic issues (Lavigne et al., 2008, p. 749).

This global problem is manifested in the local tribal communities. "Alcohol abuse and alcoholism are the leading health problems among American Indian communities" (May, 1992, p.. 5). American Indians and Alaska Natives have a disproportionally high rate of alcohol misuse

1

(Cummins et al., 2003, p. 727), and high rates of morbidity and mortality can be related to this alcohol use (Harris et al., 2003, p. 458). Compared to other ethnic groups, "Native Americans have higher rates of alcohol use, frequency of use, and increased rates of fetal alcohol syndrome" (Szlemko, Wood, & Thurman, 2006, p. 435). The rates of preventable deaths among Native American adults is 133% higher than for European Americans, and the rates for liver disease are 6 times higher (Stone et al., 2006, p. 236). The death rate for Alaska Natives from injuries is nearly five times that of the national rate (Berman, Hull, & May, 2000, p. 311). "Alcohol plays a part in most of these deaths" (p. 311).

These dismal statistics are made even worse by the fact that for Native Americans "alcohol is the drug of choice among youth, often with devastating consequences. Alcohol is a leading contributor to injury death, the main cause of death for people under age 21" (Faden & Goldman, 2004/2005, p. 111). Research has shown that when youth drink, they drink more heavily than adults. This underage drinking can lead to a variety of physical, academic, and social problems that are related to risky sexual behavior, injury death, academic failure, and the potential of developing alcohol-use disorder (p. 111).

Despite the detrimental effects of alcohol misuse on the worldwide community and especially on the Native American community, "in terms of history, cultural acceptance and current legal status in the western world, alcohol stands alone" (Cook & Reuter, 2007, p. 1183). Although it is another chemical substance that acts primarily on the nervous system to affect brain function like many other substances and although most other psychoactive drugs of abuse have been prohibited for decades, alcohol "has always been available legally for adults, except in a few countries for brief periods" (p. 1183). However, in tribal communities there is a growing awareness that a need exists for a

2

"communitywide public health approach to alcohol abuse. Regulating the supply of beverages is an essential factor" (Wolf, 1992, p. 71) in such an approach. Since alcohol abuse and alcoholism are the major health problem in the tribal communities (May, 1992), community programs are needed that promote healthy living by defining the behaviors that are acceptable in all circumstances and then communicating these to the community (Heath, 1992). Before this can be done, the attitudes of the community about alcohol need to be identified. Therefore, the purpose of this study was to describe the attitudes of those on the Blackfeet Reservation concerning an alcohol control policy for the Reservation.

Method

This study used a descriptive research design. "Descriptive research involves collecting data to answer questions about the current status of issues or topics" (Gay & Airasian, 2003, p. 10) in order to report "the way things are" (p. 275). This study reports on the current attitudes of those on the Blackfeet Reservation related to aspects of an alcohol control policy.

Descriptive research often uses a survey to collect information. "A survey is an attempt to collect data from a member of a population in order to determine the current status of that population with respect to one or more variables" (Gay & Airasian, 2003, p. 629). The survey instrument that was used to collect data for this study was designed by the Pikanii Action Program under the leadership of Dr. Dorothy Still Smoking with technical assistance from Dr. Gary J. Conti. The survey contained 26 items. All but two of the items had a choice between "yes" or "no"; the other two items had a choice on a 4-point Likert-like scale. In addition, the instrument had a demographics section with items on gender, age, head of household, educational level, income, and tribal status.

Description of the Sample

A stratified sample was solicited for participation in this survey. According to the 2000 census, the total population for the Blackfeet Reservation is 10,100 (U.S. Census Bureau, 2000). According to the formula for assuming with 90% confident that the results from the sample are within 5% of the true percentage of the population (Gay, Mills, & Airasian, 2006, p. 111; Krejcie & Morgan, 1970), a sample size of 370 is required. This number was surpassed with 400 respondents completed the survey. Data were collected in such a way as to assure that the following strata were represented in the sample: the business community, both youth and elders, and the various communities on the Reservation. The following number of surveys were collected from each strata: Businesses--50, Youth--100, Elders--50, Browning--130, Heart Butte--20, East Glacier--20, Seville--10, Babb--10, and Starr School--10.

The individual characteristics of the sample are generally representative of the overall population of the Blackfeet Reservation (see Table 1). Although the overall tribal population is split nearly equal between females (50.2%) and males (49.8%), there were slightly more females than males in the sample. The age of the respondents ranged from 13 to 89 with a mean of 35.6 years of age with a standard deviation of 17.6. The median age of 30 for the sample was slightly higher than the median age of 26.5 for the Blackfeet Reservation. However, all but 11 of the respondents were over the age of 15 while 30.7% of the population is under age 15, and the survey was not designed to sample that younger group. The sample contained slightly more respondents without a college education than the general Blackfeet Reservation population with 5.2% more in the group with less than a high school education, 5.4% more in the group with a high school level education, and 10.6% less in the group with education beyond the high school level. Most of the respondents were tribal

4

members with only 4.3% being non-Indian people; this is somewhat below the overall 13.5% White population on the Reservation.

The household makeup of the sample was also representative of the population on the Blackfeet Reservation (see Table 1). Approximately half of the respondents were the head of a household with an average family size of 3.9 which is very similar to the average family size of 3.84 for the overall Reservation. The average income for the total sample was between the income brackets starting at $9,000 and ending at $19,999 with the median income in the bracket between $15,000 to $19,999. This is below the 2000 median household income on the Reservation of $24,646. This lower household income may be a reflection of the overall decline in income in the United States since 2000 because almost half (49.4%) of the sample was below $14,999 while about one-third (32.6%) were at this level in 2000. The average income for the sample is also low because 17.5% of the respondents had a household income of less than $3,000. Thus, while there were slight differences in some areas between the sample and the general population of the Blackfeet Reservation according to the 2000 census data, overall the sample is representative of the population on the Reservation.

Table 1: Frequency of Demographic Variables

Variable	Frequency	Percent
Gender		
Male	163	41.1
Female	234	58.9
Total	397	100.0
Age Groups		
Under 21	106	27.0
21 to 30	92	23.5
31 to 48	99	25.3
49 to 89	95	24.2
Total	392	100.0
Education Groups		
Less than high school	120	30.8
High school or equivalency	117	30.1
Above high school	152	39.1
Total	389	100.0
Tribe		
Blackfeet enrolled member	310	78.3
Descendent of a Blackfeet member	43	10.9
Enrolled in another Tribe	26	6.6
Non-Indian	17	4.3
Total	396	100.0
Head of Household		
Yes	194	49.1
No	201	50.9
Total	395	100.0
Household Size for Head of Households		
Family of 1 or 2	57	22.0
Family of 3	54	20.8
Family of 4	57	22.0
Family over 4	91	35.1
Total	259	100.0
Income Groups		
Under $5,000	85	23.6
$5,000 to $14,999	93	25.8
$15,000 to $29,999	104	28.9
Over $30,000	78	21.7
Total	360	100.0

Wet or Dry Reservation?

Because this study sought to uncover the attitudes toward an alcohol policy on the Blackfeet Reservation, the primary question in the survey asked whether the respondent supports either a "wet" or a "dry" reservation. A "wet" reservation was defined as favoring the legal sales of alcohol beverages on the Blackfeet Reservation. A "dry" reservation was defined as being against the legal sales of alcohol beverages on the Blackfeet Reservation. Over two-thirds (262 or 68.1%) of the 385 who completed this survey item favored a dry reservation while less than one-third (123 or 31.9%) favored a wet reservation (see Figure 1).

Figure 1: Frequency of Supporting Either Wet or Dry Reservation
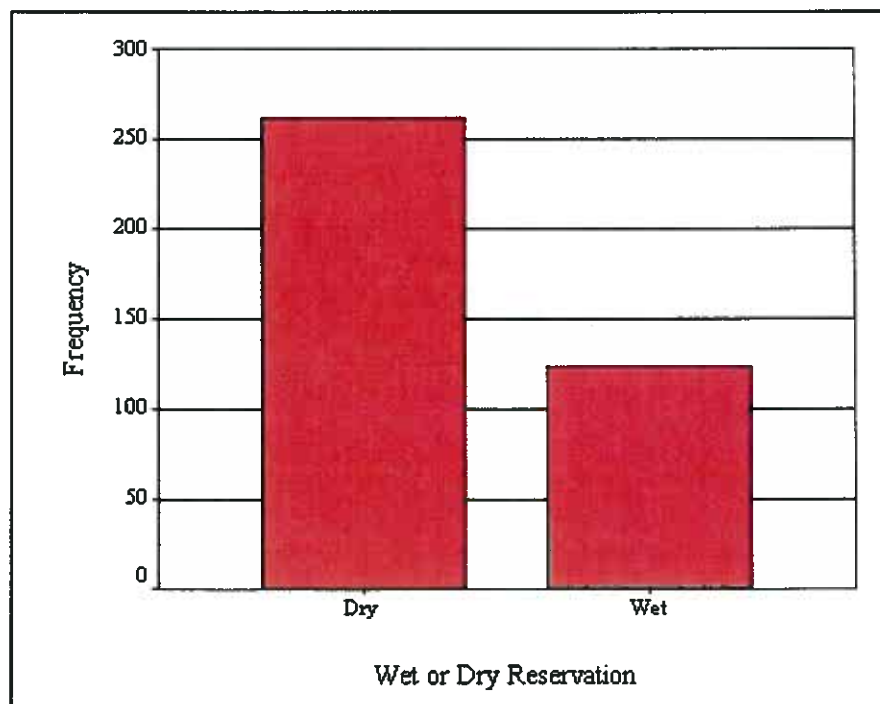
The supporters of the wet and the dry groups were examined to see if they differed from each other on any of the demographic variables collected for the study. The groupings in Table 1 were

7

used for each of the variables. Chi square is a statistical procedure that is used to compare two or more groups on a response variable that is categorical in nature (Huck, 2000, p. 618). It tests for differences in data when it is in the form of frequencies (Gay & Airasian, 2003, p. 502). Chi square "compares the proportions actually observed in a study to the proportions expected, to see if they are significantly different. Expected proportions are usually the frequencies that would be expected if the groups were equal" (pp. 502-503).

Using a criterion level of .05, no significant differences were found for five of the seven demographic variables: Education (χ^2 = .69, df = 2, p = .708), Tribe (χ^2 = .61, df = 1, p = .435), Head of Household (χ^2 = 2.04, df = 1, p = .152), Household Size (χ^2 = 1.80, df = 3, p = .614), and Income (χ^2 = 1.62, df = 3, p = .655). However, significant differences were found for gender (χ^2 = 5.30, df = 1, p = .021) and for age (χ^2 = 12.07, df = 3, p = .007). When the overall chi-square test indicates a significance difference exists in the frequency distribution of the data, the standardized residuals can be used to identify these differences (Sheskin, 2007, p. 653). A standardized residual greater than 1.96 is needed to identify cells in the frequency that are significantly different from a chance distribution. Although the males were over-represented in the group favoring a wet reservation, the standardized residual of 1.5 was below the necessary level of 1.96 to be a systematic difference. For the age groups, the young were generally over-represented in the group favoring a wet reservation; however, the group that was significantly different from chance placement was the 49 to 89 year old age group. With a standard residual of 2.3, this age group had significantly less of those who supported a wet reservation.

Thus, the supporters of a wet reservation did not vary greatly on demographic variables from the supporters of the dry reservation. While more males tended to support a wet reservation, the

8

distribution of males between the two groups was not large enough to be significant. The only grouping that was significantly different than expected was the oldest age group which had fewer supporters of a wet reservation.

Items Related to Alcohol on Reservation

In addition to asking about one's preference for either a wet or dry reservation, the survey contained 25 additional questions related to alcohol use and its ramifications on the Reservation. For each of the items, the participants were asked to respond to how they felt the item would apply if the Reservation was dry; the response choices were either "Yes" or "No". In order to organize these 25 items into manageable groups, the items were subjected to a factor analysis. Factor analysis is a powerful statistical technique that is used to remove the redundancy from a set of correlated variables by placing them into a smaller set of derived factors (Kachigan, 1991, p. 237). Using some of the options of this statistical procedure such as principal component analysis and varimax rotation, the factor analysis grouped the items into three factors. The factors contained the following number of items: Factor 1–18, Factor 2–3, and Factor 3–4 (see Table 2).

Table 2: Factor Analysis of 25 Items in Survey

Item No.	Item	Factor		
		1	2	3
4Q	The morale of our community members would rise	0.80	0.01	-0.14
4A	There would be less car crashes	0.71	0.17	-0.03
4R	Communities would be more self-directed and self-sufficient	0.70	-0.02	0.08
4P	Our communities would be safer	0.70	-0.05	-0.11
4M	There would be less domestic violence	0.69	-0.05	0.05
4S	Our tribal culture and language would flourish more	0.67	0.12	0.21
4G	There would be less elder abuse	0.67	-0.27	0.16
4K	There would be a drop in traumatic tragic accidents	0.67	-0.08	-0.09
4I	The alcohol abuse rate would go down	0.67	0.01	0.14
4O	There would be more time for family-initiated activities	0.64	0.11	0.20
4F	There would be less crime	0.64	-0.14	-0.01
4H	Would be less opportunity for youth to have access to alcohol	0.64	0.07	0.17
4E	Police would have more time for prevention programs	0.64	0.19	0.13
4T	There would be less child abuse and child neglect	0.64	-0.17	0.16
4B	Would be less Driving Under Influence (DUIs) violations	0.62	0.17	0.03
4D	Would be more funding for alcohol prevention programs	0.49	0.13	0.21
4J	There would be less drug abuse	0.48	0.10	0.07
4N	There would not be a street people issue	0.41	-0.10	0.25
1C	A Friend--affected by a motor vehicle crash	-0.02	0.73	0.12
1B	Family Member--affected by a motor vehicle crash	0.07	0.73	-0.08
1A	You--affected by a motor vehicle crash	0.02	0.71	0.10
2	How frequently crashes involve alcohol use	0.21	0.14	0.68
3	Problem underage drinking	0.19	-0.03	0.67
4C	There would be more bootlegging	0.02	0.05	0.52
4L	There would be a rise in prescription drug abuse	-0.08	0.00	0.52

Factor 1 was a general factor. That is, it contained a large number of items that represented

a major dimension of the alcohol-related items in the survey. Because the factor contained so many

items and because it was general in nature, an additional factor analysis was conducted using just

the 18 item in this factor. This analysis produced three subfactors (see Table 3). Subfactor 1

10

contained 8 items that dealt with the overall theme of Less Violence. Subfactor 2 contained 6 items that dealt with the overall theme of a Focus on People. Subfactor 3 contained 4 items that dealt with the overall theme of Prevention.

Table 3: Factor Analysis of 18 Items in General Factor

Item No.	Item	Factor		
		1	2	3
4F	There would be less crime	0.72	0.06	0.32
4K	There would be a drop in traumatic tragic accidents	0.70	0.11	0.27
4G	There would be less elder abuse	0.62	0.39	0.07
4T	There would be less child abuse and child neglect	0.61	0.47	-0.04
4P	Our communities would be safer	0.59	0.31	0.24
4R	Communities be more self-directed and self-sufficient	0.57	0.34	0.29
4M	There would be less domestic violence	0.52	0.49	0.17
4Q	The morale of our community members would rise	0.50	0.42	0.37
4S	Our tribal culture and language would flourish more	0.16	0.71	0.33
4O	There would be more time for family-initiated activities	0.11	0.70	0.31
4H	Would be less opportunity for youth to have access to alcohol	0.23	0.66	0.23
4I	The alcohol abuse rate would go down	0.28	0.53	0.36
4J	There would be less drug abuse	0.28	0.48	0.12
4N	There would not be a street people issue	0.20	0.48	0.04
4E	Police would have more time for prevention programs	0.22	0.21	0.78
4D	Would be more funding for alcohol prevention programs	0.13	0.12	0.73
4B	Would be less Driving Under Influence (DUIs) violations	0.23	0.32	0.57
4A	There would be less car crashes	0.40	0.32	0.53

Less Violence

Collectively, the eight items in Subfactor 1 of the general factor address various types of violence in the community (see Table 4). Overall, approximately two-thirds (64.4%) of the respondents agree that there would be less violence on the Blackfeet Reservation if alcohol was controlled so that the Reservation was a dry community. Slightly less than three-fourths felt that

11

there would less abuse and neglect of children (71.5%) and less abuse of elders (70.2%) if the reservation was dry. Approximately two-thirds of the respondents felt that there would be less traumatic accidents (65.8%) and that the Blackfeet community would be safer (64.7%) and more self-sufficient (63.2%) with a higher morale (68.3%) if the Reservation was dry. Over half felt that there would be less crime (52.2%) and less domestic violence (59.6%). Thus, a huge portion of the respondents feel that there is a connection between allowing alcohol on the Reservation and various types of violence and low self-esteem that exists on the Reservation.

Table 4: Frequency of Responses for 8 Items in Subfactor of Less Violence

Item No.	Item	Frequency		Percent	
		Yes	No	Yes	No
4T	There would be less child abuse and child neglect	279	111	71.5	28.5
4G	There would be less elder abuse	275	117	70.2	29.8
4Q	The morale of our community members would rise	261	121	68.3	31.7
4K	There would be a drop in traumatic tragic accidents	256	133	65.8	34.2
4P	Our communities would be safer	251	137	64.7	35.3
4R	Communities be more self-directed and self-sufficient	244	142	63.2	36.8
4M	There would be less domestic violence	233	158	59.6	40.4
4F	There would be less crime	206	189	52.2	47.8
Average		250.6	138.5	64.4	35.6

Focus on People

The six items in Subfactor 2 of the general factor focus on the ways the people in the community could benefit if alcohol was not allowed on the Reservation (see Table 5). Overwhelmingly, three-fourths of the respondents felt that there would be less alcohol abuse (75.4%) and less access for youth to alcohol (75.6%) if the Reservation was dry. Nearly as many felt that a dry Reservation would foster more family-initiated activities (71.6%). Slightly less than two-thirds felt that a dry Reservation would help promote the Blackfeet culture and language (61.3%).

12

However, the respondents did not link having a dry Reservation with other issues that might be influenced by alcohol. Only slightly over half of the respondents felt that a dry Reservation would alleviate the issue of having street people (56.1%), and over two-thirds did not think it would contribute to a reduction in drug abuse (31.6%).

Table 5: Frequency of Responses for 6 Items in Subfactor of Focus on People

Item No.	Item	Frequency		Percent	
		Yes	No	Yes	No
4I	The alcohol abuse rate would go down	295	96	75.4	24.6
4H	Be less opportunity for youth to have access to alcohol	294	100	74.6	25.4
4O	There would be more time for family-initiated activities	278	110	71.6	28.4
4S	Our tribal culture and language would flourish more	236	149	61.3	38.7
4N	There would not be a street people issue	217	170	56.1	43.9
4J	There would be less drug abuse	125	270	31.6	68.4
Average		240.8	149.2	61.8	38.2

Prevention

The four items in Subfactor 3 of the general factor focus on preventive factors that could result if alcohol was not allowed on the Reservation (see Table 6). Although the scores were not as high in this area, approximately six in ten of the respondents felt that various kinds of preventative measures would result from the Reservation being dry. While the respondents did not link the control of alcohol with a reduction in drugs abuse in the Focus on People subfactor, they did link it with the prevention of automobile accidents (61.8%) and with less traffic violations resulting from driving while under the influence of alcohol (59.7%). They also felt that a dry Reservation would allow for more money being available for alcohol prevention programs (60.5%) and for the police to have more time to focus on prevention (59.3%) rather than enforcement.

Table 6: Frequency of Responses for 4 Items in Subfactor of Prevention

Item No.	Item	Frequency		Percent	
		Yes	No	Yes	No
4A	There would be less car crashes	243	150	61.8	38.2
4D	Be more funding for alcohol prevention programs	235	154	60.4	39.6
4B	Be less Driving Under Influence (DUIs) violations	237	160	59.7	40.3
4E	Police would have more time for prevention programs	235	161	59.3	40.7
Average		237.5	156.3	60.3	39.7

Affected Personally

Factor 2 contained three items that asked the respondent if they have been involved in a motor vehicle crash or if they have had friends or relatives involved in a automobile accident (see Table 7). The response choices were either "Yes" or "No". Over two-thirds of the respondents have been affected by an automobile accident by having either a friend (69.9%) or family member (68.5%) involved in an accident. Slightly over half have been directly affected by an automobile accident (53.5%). Thus, motor vehicle crashes are a real and common occurrence for most of the respondents.

Table 7: Frequency of Responses for 3 Items for Affected Personally Factor

Item No.	Item	Frequency		Percent	
		Yes	No	Yes	No
1C	A friend affected by a motor vehicle crash	251	108	69.9	30.1
1B	Family member affected by a motor vehicle crash	255	118	68.4	31.6
1A	Personally affected by a motor vehicle crash	192	167	53.5	46.5
Average		232.7	131	63.9	36.1

Illegal Activities

Factor 3 contained four items that involve alcohol in an illegal activity (see Table 8). Two of the items were from the list of 25 items with response choices of either "Yes" or "No". One item asked about how frequently the respondent believed that automobile accidents on the Blackfeet

14

Reservation involved the use of alcohol and had a response choice of 1 = Always, 2 = Often, 3 = Sometimes, and 4 = Never. The fourth item asked about how much of a problem the respondent felt that underage drinking is on the Blackfeet Reservation and had a response choice of 1 = Huge Problem, 2 = Great Problem, 3 = Somewhat of a Problem, and 4 = Not a Problem. For the two items with the dichotomus Yes/No response, three-fourths felt that having a dry reservation would lead to the greater abuse of prescription drugs (75.4%). Even more felt that this would lead to illegal bootlegging (83%). Overwhelmingly, the respondents felt that drinking is either Always (40.4%) or Often (47.4%) involved in vehicle crashes. In addition, it is Sometimes involved in another 11% of the crashes. When these are combined, it indicates that the respondents feel that alcohol is involved in almost all (98.7%) of the motor vehicle crashes. Moreover, the respondents felt that the illegal nature of alcohol use is a major problem for youth on the Blackfeet Reservation. Slightly over two-thirds of the respondents felt that underage drinking is a Huge Problem (67.6%) on the Blackfeet Reservation. Nearly one-fourth felt that it is a Great Problem (23.15). Only a small group felt that underage drinking was Somewhat of a Problem (8.3%), and only an extremely small group felt that underage drinking is Not a Problem (1%) on the Blackfeet Reservation.

Table 8: Frequency of Responses for 4 Items for Illegal Activities Factor

Item No.	Item	Frequency		Percent	
		Yes	No	Yes	No
4C	There would be more bootlegging	328	67	83.0	17.0
4L	There would be a rise in prescription drug abuse	295	96	75.4	24.6
Average		311.5	81.5	79.2	20.8

No.	Item	Always	Often	Sometimes	Never
2	How frequently crashes involve alcohol use	Frequency			
		161	189	44	5
		Percent			
		40.4	47.4	11.0	1.3

No.	Item	Huge	Great	Somewhat	Not
3	Problem underage drinking	Frequency			
		269	92	33	4
		Percent			
		67.6	23.1	8.3	1.0

Difference Between Wet and Dry Supporters

In addition to examining the variables in the survey in a univariate manner (i.e., one variable at a time), the variables in the survey were examined as a group to determine if they could be used to help describe the differences between those who supported a dry reservation and those who favored a wet reservation. Discriminant analysis was used for this analysis because it is a statistical procedure that is interested in the interaction of the variables in the analysis (Conti, 1993, pp. 90-91). Discriminant analysis is a statistical procedure "for examining the difference between two or more groups of objects with respect to several variables simultaneously" (Klecka, 1980, p. 5). It identifies the relationship between membership in a group and a set of predictor variables (Kachigan, 1991, p. 216). As a multivariate statistical procedure, it examines the

16

interaction of the predictor variables on discriminating between the groups. As a result, discriminant analysis has the ability to "simultaneously analyze multiple variables that have the potential of explaining group placement" (Conti, 1993, p. 90).

Discriminant analysis is used to help the researcher to be able to "discriminate" between the groups on the basis of some set of characteristics, to be able to tell how well these characteristics discriminate, and to determine which characteristics are the most powerful discriminators (Klecka, 1980, p. 9). To conduct a discriminant analysis in the social sciences, people are grouped according to some meaningful criterion (Kachigan, 1991, p. 218), and then predictor variables are used to determine their accuracy in correctly classifying the people in their proper group (Conti, 1993, pp. 91-92; Kachigan, 1991, pp. 218-219; Klecka, 1980, pp. 8-14).

The discriminant analysis procedure produces many statistics to help the researcher interpret the results of the analysis. The three that are of most importance in describing the groups are the discriminant function, the classification table, and the structure matrix. The discriminant analysis produces a discriminant function which is a formula that the procedure uses for placing people in the groups (Conti, 1993, p. 91). The accuracy of the discriminant function in placing people in their groups is displayed in the classification table (p. 91). This accuracy should be judged in relationship to the likelihood of placement by chance in the group. For example, if there are two groups, a person has a 50% likelihood of being placed in either group simply based on chance such as by flipping a coin. Therefore, the usefulness of the discriminant analysis in providing information on how the predictor variables discriminate between the groups should be judged by how much improvement there is over the 50% level. If there were three groups, the chance level would be 33.3%, and this is the level that would be used for judging

17

improvement over chance.

The discriminant analysis also produces a structure matrix. The structure matrix is a table of the correlation coefficients that show the relationship between the individual predictor variables and the discriminant function (Conti, 1993, pp. 93-94). The structure matrix is used to "name" the discriminant function (Klecka, 1980, p. 31). This naming identifies the process that separates the groups and can be used for describing the groups (Conti, 1996, p. 71). Thus, the structure matrix "is used to name the discriminant function so that qualitative terms exist to explain the interaction that exists among the variable in distinguishing among the groups" (p. 91).

Discriminant analysis was used to identify the process that separated or discriminated between the group that supported a wet reservation and the group that supported a dry reservation. The other 25 items in the survey were used as the discriminating variables. Discriminant analysis was used to determine if an *interaction* existed among any of these discriminating variables in correctly distinguishing a respondents group membership.

The discriminant function was 78.5% accurate in placing respondents in their correct group of either supporting a wet or a dry reservation. The discriminant function had about equal accuracy in predicting membership in each group (see Table 9). This accuracy was a 28.5% improvement over the chance placement of 50% for the two groups, and it left only 21.5% (100 - 78.5 = 21.5) of the variance unexplained.

18

Table 9: Accuracy of Discriminant Analysis in Classifying Group Membership

Group	Predicted Group Membership		Total
	Dry	Wet	
Number in Each Group			
Dry	219	58	277
Wet	28	95	123
Percent of Placement			
Dry	79.06	20.94	100
Wet	22.76	77.24	100

The structure matrix was used to name this process that separated the two groups. The correlations in the structure matrix represent the amount that each individual item correlates with the overall discriminant function. The items with the highest correlation are the strongest in describing the process. Ten items had correlations at .45 or above (see Table 10). The two strongest had correlations above .6, and one other item had a correlation above .5. While these could be used to name the process that separates the group, the six items above .45 but below .5 help were also used because they help clarify the function. Collectively, the items deal with violence. Poor people have a lot of violence in their lives (Horton, 1990). The high percentage of the dry group that supported the items indicates that they believe that this violence is not inevitable and that they can have some control over it. On the other hand, the high percentage from the wet group that disagreed with the items indicates an acceptance of this violence as a natural part of daily life. While the dry group believed that an alcohol control policy would allow preventative programs by the police and would stimulate more self-direction and supportive cultural activities, the wet group did not think this was possible. Thus, the acceptance of the concept of violence in one's life is a process that distinguishes the supporters of a dry reservation from those who want the reservation to remain wet with those supporting a dry reservation feeling that they have more control over this violence and feeling it can

be prevented than those supporting a wet reservation.

Table 10: Items from Survey that Discriminate Wet and Dry Groups

Corr.	No.	Item	% Yes Wet	% Yes Dry
0.64	4A	There would be less car crashes	76	31
0.60	4I	The alcohol abuse rate would go down	74	32
0.52	4E	Police Officers would have more time for prevention programs	71	33
0.49	4G	There would be less elder abuse	80	47
0.48	4B	There would be less Driving Under Influence (DUIs) violations	70	35
0.47	4H	Would be less opportunity for youth to have access to alcohol	84	53
0.47	4R	Communities would be more self-directed and self-sufficient	73	39
0.47	4S	Our tribal culture and language would flourish more	71	37
0.47	4Q	The morale of our community members would rise	77	45
0.45	4F	There would be less crime	62	29

Naturally-Occurring Groups

Cluster Analysis

The previous analyses in this study used a deductive approach for analyzing the data. That is, people and the data were placed in groups and analyzed based on the preconceived notions of the researcher. However, it is also possible to use statistical procedures to explore for and describe naturally-occurring groups that exist in the data. To do this, cluster analysis was used to identify the naturally-occurring groups on the Blackfeet Reservation based on their attitudes toward alcohol, and discriminant analysis was used to identify the process that separated these groups.

Cluster analysis is a "set of techniques for accomplishing the task of partitioning a set of objects into relatively homogeneous subsets based on the inter-object similarities" (Kachigan, 1991, p. 261). That is, it is a procedure in which "we ask whether a given group can be partitioned into subgroups which differ" (p. 262). Cluster analysis reveals naturally-occurring groups in the data because it groups "objects or individuals into homogenous clusters such that objects or subjects in

20

a given cluster are more similar to one another than objects or subjects of a different cluster" (Sheskin, 2007, p. 1635). Thus, for the social sciences, "cluster analysis is a powerful multivariate tool for inductively making sense of quantitative data. Its power lies in its ability to examine the person in a holistic manner rather than as a set of unrelated variables. Cluster analysis can be used to identify groups which inherently exist in the data" (Conti, 1996, p. 71).

The 26 items in the survey were used to see if people on the Blackfeet Reservation formed any natural groups based on their attitudes toward alcohol. In this process, clusters are formed sequentially in a hierarchical order starting with the total number of people in the dataset (Kachigan, 1991, p. 269). In this study, the statistical program examined all 400 respondents and identifies the two that were the most alike on these 26 items. It put them into a group and blended their characteristics. It is important to realize that cluster analysis examines the person as a whole. Therefore, the items on which they were very similar became strong characteristics for the new group while the ones upon which they differed became weaker.

After the statistical procedure places two people into a group, it treats the group the same as an individual. Therefore, the data set now had 399 cases. The statistical procedure continued the process of grouping either individuals, individuals and groups, or groups and groups in a hierarchical order until it was down to one group, which was the total data set. Once an individual or a group was combined with another individual or group, they remained together through the entire analysis. Thus, the process starts with each person in the dataset identified as an individual and processes to where everyone is in one single group. At each step, either one individual or one existing cluster is combined with another individual or existing cluster. This sequential process is repeated for as many times as there are individuals in the dataset.

21

The way that the clusters are formed in the hierarchical clustering process is influenced by the similarity of the individuals in the cluster and by the distance between the clusters; similarities and distances are complements of one another (Kachigan, 1991, p. 264). The concept of similarity is synonymous with resemblance, proximity, and association of items within a cluster (Aldenderfer & Blashfield, 1984, p. 17). Various metrics have been developed to measure these similarities. A commonly used measure for measuring the similarity between two cases is the Euclidean distance (Kachigan, 1991, p. 265). The squared Euclidean distance is the sum of the square of the differences over all of the variables (Conti, 1996, p. 69).

There are several methods for determining how cases will be combined into clusters in a cluster analysis (Aldenderfer & Blashfield, 1984, p. 35). Hierarchical agglomerative methods have been dominant in terms of the most frequently used method (p. 35). Within the hierarchical agglomerative methods, Ward's method has been the most widely used procedure in the social sciences for linking the clusters in the analysis (p. 43). The strength of this method is that "it tends to find (or create) clusters of relatively equal sizes and shapes" (p. 43).

After the cluster analysis procedure is run, the task of the researcher is to determine the "optimal number of groups" (Aldenderfer & Blashfield, 1984, p. 53) for the analysis. Two basic approaches have evolved for doing this; they are heuristic procedures and formal tests (p. 54). While several techniques have been developed for each, the "heuristic procedures are by far the most commonly used methods" (p. 54).

Clusters on the Blackfeet Reservation

Cluster analysis was used to explore for naturally-occurring groups based on the 400 responses to the 26 items in the survey. The clusters were formed using hierarchical cluster analysis.

22

The squared Euclidean distance was used to measure the distance between the cases. The Ward's method was used for linking cases into clusters.

Using these options for the statistical analysis, a 2-cluster solution was judged the best explanation of the data (see Figure 2). At the 2-cluster level, the size of the groups are distributed more equitably than at the other levels: 207 (51.8%) and 193 (48.3%). At the 3-cluster level, the group of 193 divided into groups of 147 and 46; at this level, the largest group in the data set of 207 is 4.5 times larger than the smallest group of 46. At the 4-cluster level, the group of 147 divided into groups of 101 and 46, so at this level the largest group is still 4.5 times larger than the smallest group. At the 5-cluster level, one group of 46 divided into groups of 26 and 20; as a result, the largest group is over 10 times larger than the smallest group at this level. At the 6-cluster level, the large group of 207 began to divide into smaller groups. Thus, it is only at the 2-cluster level that fairly large groups exist in the data that are somewhat equal to each other in size.

Figure 2: Cluster Formation Related to Beliefs about Alcohol Control
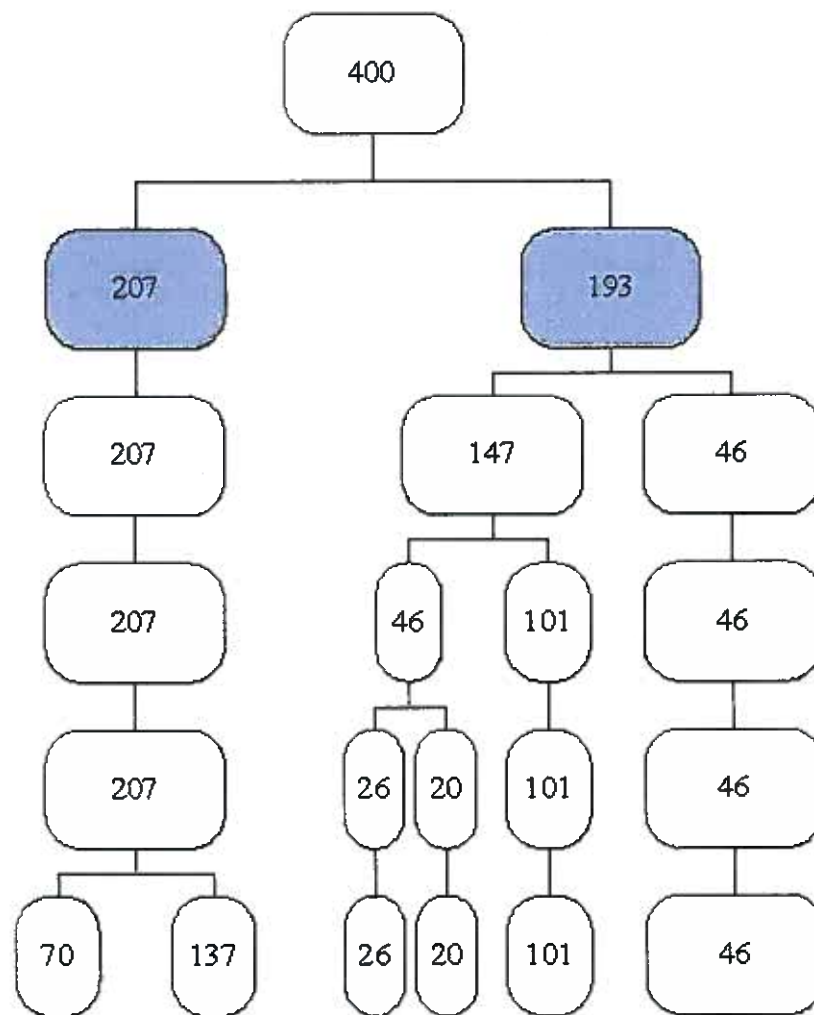
Naming the Clusters

While knowing the number of clusters (i.e., naturally-occurring groups) that exist in a data set is useful, the practical significance is in being able to describe these groups. "Once the object clusters have been formed, they must be compared in order to get some idea of how they differ. The most straightforward approach is to compare the clusters with respect to their means and variance" (Kachigan, 1991, p. 269). While this can be done with univariate analysis comparing the groups one

variable at a time, an interactive way of comparing the groups on the variables is to use discriminant analysis (Conti, 1996, p. 71; Kachigan, 1991, p. 269).

When discriminant analysis is used in conjunction with cluster analysis in order to name the process that separates the clusters, the discriminant analysis uses the same variables that were used in the cluster analysis as the predictor variables and uses the groups from the cluster analysis as the grouping criterion; consequently, only the classification table and the structure matrix are used from the discriminant analysis for naming the process that separates the group (Conti, 1996, p. 71). Since the groups were created statistically by cluster analysis, the accuracy of the classification rate should be very high. If the classification accuracy is not high, then the discriminant analysis will not be helpful in providing information on how the predictor variables discriminate between the groups. Once a high degree of accuracy is confirmed by the classification table, the structure matrix is used to name the process that separates the groups.

For this discriminant analysis, the groups from the 2-cluster level of the cluster analysis were used, and the 26 items from the survey were used as predictor or discriminating variables. The discriminant function produced by this analysis was 95.5% accurate in placing the participants in their correct group. The structure matrix contained eight items which had a correlation with the discriminant function of .35 or above, and these items were used in naming the process that separated the two groups (see Table 11).

Table 11: Items from Survey that Discriminate Groups of 207 and 193

Corr.	No.	Item	% Yes	
			207	193
0.48	4F	There would be less crime	84	18
0.48	4Q	The morale of our community members would rise	97	37
0.48	4A	There would be less car crashes	93	30
0.40	4M	There would be less domestic violence	87	30
0.39	4R	Communities would be more self-directed and self-sufficient	90	34
0.38	4E	Police Officers would have more time for prevention programs	86	31
0.35	4I	The alcohol abuse rate would go down	87	35
0.35	4P	Our communities would be safer	89	38

The eight items in the structure matrix with the highest correlations deal with three concepts.

These are safety (Items 4F, 4A, 4M, 4P) , mental health (Items 4Q, 4R, 4I), and prevention (Items

4E). Collectively, they deal with the overall Health of the Community. The group of 207 had a high

percentage of agreement with these statement; this indicates that they are highly optimistic that

having a dry reservation would bring about positive things to improve the overall Health of the

Community. On the other hand, the group of 193 is pessimistic; their low support of these items

indicates that they do not believe that changing to a dry reservation will improve the overall Health

of the Community.

Conclusions

The following conclusions can be drawn from the data from the survey and from the various

analyses performed on the data:

1. Very strong support exists on the Blackfeet Reservation for an alcohol control
   policy.

2. Members of the Blackfeet Reservation perceive a connection between
   violence and alcohol and believe that this violence can be reduced by an
   alcohol control policy.

3. While an alcohol control policy could support positive things like more

prevention measures, it may also stimulate more illegal activities.

4. There are two drastically different views about the nature of violence in the community and how an alcohol control policy relates to this violence.

5. The Blackfeet community is split almost equally concerning how an alcohol control policy will affect the overall health of the community.

Discussion

An alcohol control policy is a complicated concept. An alcohol control policy can be as simple as that established by the 18th Amendment to the U.S. Constitution or can be a comprehensive plan as implemented in the Nordic Countries. In order to avoid confusion in this study over exactly what an alcohol control policy is or debate about what elements such a policy should contain, one simple question was used as a proxy for alcohol control policy. This question asked if the legal sale of alcohol beverages should be allowed on the Blackfeet Reservation. Overwhelmingly, the respondents favored the restriction of the sale of alcoholic beverages on the Reservation. Their responses to the other items in the survey gave clarity to their perceptions that support this opposition to having the ready availability of alcohol in the community.

The respondents perceived a clear connection between alcohol and violence in both their lives and their community. The violence faced by those living in poor communities takes many forms; it is a violence of oppression, and the choice is often between lesser forms of violence (Moyer, 1990, p. 7). The great majority of the respondents saw this choice as between having alcohol in the community and not having it available. The violence caused by alcohol varied from the physical type that results in death and injury to the tribal members and in the devastation of the youth to the psychological type that results in the neglect of the culture and of the basic structure of the family. It includes abuse to the Elders and other family members. Those who support an alcohol

27

control policy have a hopeful view that this violence can be overcome if alcohol is removed from the community. Those with this sanguine view make up two-thirds of the community. On the other hand, about one-third of those in the community, which is the group who oppose an alcohol control policy, do not believe that a policy can bring about these positive changes in the community.

The first step in implementing an alcohol control policy is to assess the community's attitude toward such a policy. The findings from this study indicate that there is widespread support in the community for an alcohol control policy. However, it is up to the policy makers to determine what that policy should be. On the Blackfeet Reservation, these policy makers are the members of the Tribal Council. Alcohol is already regulated at certain times on the Reservation such as at pow wows. However, an effective alcohol control policy requires a community-wide strategy that includes prevention, treatment, and rehabilitation (Gallaher et al., 1992). Such a control policy "should be constructed with a clear commitment to reducing total harm [from alcohol] and a pragmatic openness to the evidence of what works" (Cook & Reuter, 2007, p. 1183).

As the World Health Organization has pointed out, alcohol control polices should emphasize preventive measures (Brand et al., 2007, p. 753). Policies that are not well thought out can lead to unintentional and undesirable results. For example, a study found that Native Americans in New Mexico were 30 times more likely to die from hypothermia and 8 times more likely to die in pedestrian motor-vehicle accidents following the banning of alcohol on the reservation because many intoxicated males traveled on foot to nearby towns to get alcoholic beverages (Gallaher et al., 1992). Likewise, restrictions places on alcohol may drive youth to more dangerous substances and behavior (Stamm & Frick, 2009), and these restrictions may lead to heavy drinkers increasing their consumption of other intoxicating substances or cheaper alcohol that is more dangerous (Humphrey,

2010). Moreover, the control policy that is implemented should focus on public health and social

policy objectives rather than on trade and commercial objectives (Ugland, 2010). Overall, the alcohol

control policy should seek to "impose various regulations to mitigate the adverse effects of alcohol

while attempting to respect individuals' rights to consume alcohol in moderation" (Brand et al.,

2007, p. 753).

As "The Year of Sobriety" in Lithuania demonstrated, a comprehensive alcohol control

policy can lead to a reduction in alcohol consumption and thus become an effective health policy

(Veryga, 2009). The elements of the overall alcohol control policy that were implemented in

Lithuania included the following:

- Regulation of advertising for alcohol
- Increased taxes on alcohol
- Restrictions on the opening hours for alcohol servers
- Prohibiting the sale of alcohol in certain settings
- Increased fines for drinking and driving
- Confiscation of vehicles for drinking and driving
- Revision of the permissible alcohol concentration in the blood for novice drivers.

Although the amount of alcohol bought and consumed was reduced, tax revenues increased as a

result of these measures. These increased funds are now available for treatment of alcohol-related

diseases and prevention activities.

It has been documented extensively that the price of alcohol "affects substantially the levels

and patterns of drinking and rates of alcohol-related problems" (Makela et al., 2007, p. 181). The

level of taxation on alcohol can be a measure to raise the price of alcohol (Paschall, Grube, & Kypri,

2009). This price rise is especially effective in limiting access of alcohol for youth because of their

limited resources for obtaining alcohol. Restrictions on the availability and marketing of alcohol

have been shown to be "associated with lower prevalence and frequency of adolescent alcohol

consumption and age of first alcohol use" (p. 1849).

In addition to price, there are several other regulations that can be taken to control the availability of alcohol in the community. These include the following:

- Setting a minimum legal age for purchasing or drinking alcohol
- Restricting the types of alcoholic beverages that can be sold in stores
- Restricting the number of stores selling alcohol in an area
- Restricting the hours of business when alcohol can be sold
- Mandatory training of alcoholic beverage servers. (Paschall, Grube, & Kypri, 2009p. 1849)

Summary

Thus, an alcohol control policy can contain many diverse elements and regulations. Whatever measures it includes, it should be focused on health policy rather than being a repressive or commercial policy. Policies to manage and control alcohol have been shown to be effective in tribal communities (Berman, Hull, & May, 2000; Gliksman, Rylett, & Douglas, 2007). A large segment of those on the Blackfeet Reservation feel that an alcohol control policy can improve the overall health of the community even though they realize that it may have undesirable consequences such as encouraging illegal drug use or bootlegging. Nevertheless, through this survey, the have spoken loudly and clearly of their support for an alcohol control policy. Based on this voice from the people, it is time for the policy makers on the Reservation to thoughtfully and deliberately begin the process of formulating such a policy for the Blackfeet Reservation.

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